Dynasonics®
Ultrasonic Flow Meters

IS-4000

Open-Channel Flow Meter

DESCRIPTION

An economical open-channel flow meter, IS-4000 measures level, flow rate and total volume of water flowing through weirs and flumes. The meter includes a non-contact ultrasonic level sensor to detect the water level and then calculates the flow rate and total volume based on characteristics of the channel. All the measurements are available over Modbus RTU or Modbus TCP Ethernet and can be logged for historical records.

BENEFITS

- Measure level, flow rate and total volume with a single device
- Simple setup for flumes and weirs
- Automatically retains an historical log of all measurements and configuration events
- Easily connect up to SCADA systems
- Connectivity with BEACON Advanced Metering Analytics (AMA) or AquaCUE Flow Measurement Manager

OPERATION

Based on empirical formulas, the IS-4000 calculates the flow rate based on the geometry of the channel or primary device and water depth. The level sensor measures the depth of the water used in the calculation.

The IS-4000 includes a selection of primary devices with preprogrammed tables to simplify the setup, including:

- Parshall flumes
- Manhole flumes
- V-notch weirs

Additionally, you can enter custom tables using the Flow Meter Tool software.

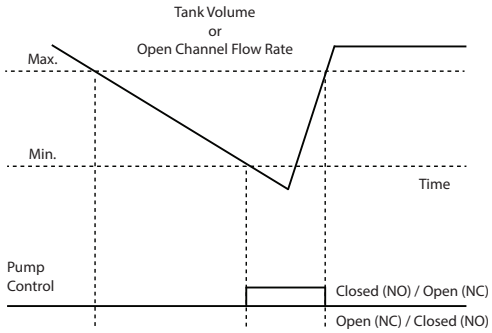
APPLICATIONS

Open channels with a primary device are a cost effective solution for managing varying flow rates in unpressurized systems. The IS-4000 flow meter performs best when used with a primary device, such as a flume or weir, and where the sediment does not build up.

- Flow into water treatment plants from reservoirs
- Storm and sanitary sewer systems
- Effluent from water resource recovery or wastewater treatment
- Industrial discharge
- Agriculture irrigation channels

PUMP CONTROL OPTION

The Pump Control option automatically starts and stops the pump based on water level.



SPECIFICATIONS

System Specifications

Liquid Types	Unpressurized liquids with minimal foam in open channels or partially filled pipes
Channel Selection	Weir: Contracted rectangular, suppressed rectangular, Cipoletti; V-notch weir (30°, 45°, 60°, 90°); Flume: Parshall (1, 2, 3, 6, 9, 12, 18, 24, 36, 48 and 60 in.); Manhole flume (4, 6, 8, 10 and 12 in.), Manning rectangle (up to 9.8 ft, 6 m) Pipes and Other: Manning pipe, exponential equation

(Specifications continued on next page)

Badger Meter®

HYB-DS-02510-EN-08 (September 2023)

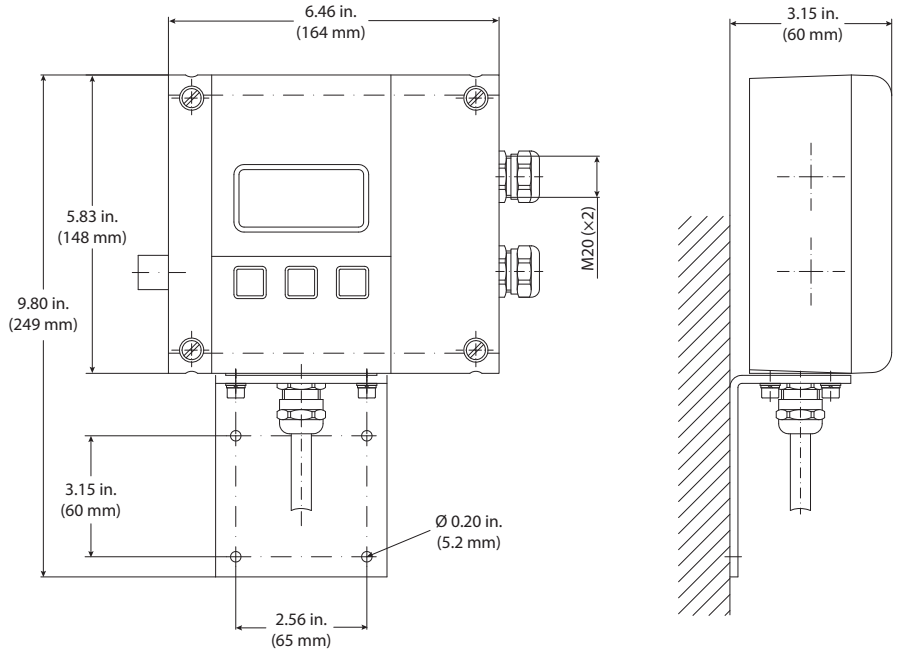
Product Data Sheet

Electronics Specifications

Power	92…275V AC (50/60 Hz), < 14 VA
Display	Graphical LCD 64 × 128, backlight, actual flow rate, totalizers, status display
Configuration	3 front-panel mounted push-buttons or mini USB with IP67 connector included
Enclosure	Die cast powder-coated aluminium, protection class IP67
Cable Connection	Supply and signal cables 2 × M20; cable glands included From meter M20; cable gland included
Environmental	–4…140° F (–20 up to 60° C)
Analog output	4…20 mA, 0…20 mA, 0…10 mA ≤ 800 Ohm, active or passive; Assigned parameter depends on flow meter mode
Level sensor input	4…20 mA from level sensor
Digital outputs	2 open collectors; passive: maximum 32V DC, 0…100 Hz 100 mA, 100…10.000 Hz 20 mA; active: 24V DC, maximum 20 mA; Select active pulse (up to 2000 msec), minimum/maximum alarm, error messages or pump control
	Solid-state relay (n.o./n.c.) maximum 230V AC, 500 mA, 1 Hz; Function is linked with open collector output 2
Digital input	5…30V DC; totalizer reset, positive return zero, BEACON/AquaCUE connectivity
Communication	RS485 Modbus RTU, Modbus TCP/IP Ethernet, BEACON/AquaCUE connectivity
Programming port	Mini B USB, IP67
Datalogger	2 MB capacity with 130,000 logged lines: date, level, flow rate, tank volume
Security	Three-level password
Languages	English, French, German, Italian, Spanish, Czech, Russian
Certification	CE Low Voltage Directive 2014/35/EU, EMC 2014/30/EU, RoHS 2006 2011/65/EU, 2015/863/EU, 2017/2102/EU

Sensors Specifications

Sensor Type	DL 10 Ultrasonic	DL 24 Ultrasonic	ULM 53 Ultrasonic	ULM 70 Ultrasonic	C 21 Radar
Measuring Range	2…49.21 in. (50…1250 mm)	0.33…9.8 ft (100…3000 mm)	0.66…19.7 ft (200…6000 mm)	0.5…6.6 ft (150…2000 mm)	0.82…49.2 ft (250…15000 mm)
Beam Width	2°	2°	14°	10°	8°
Accuracy	0.125 in. (3 mm)	0.25 in. (6 mm)	0.35 in. (9 mm)	0.125 in. (3 mm)	0.08 in. (2 mm)
Deadband	2 in. (50 mm)	4 in. (100 mm)	8 in. (200 mm)	6 in. (150 mm)	9.84 in. (250 mm)
Ambient Temperature	–31…140° F (–35…60° C)	–31…140° F (–35…60° C)	–22…158° F (–3…70° C)	–22…158° F (–3…70° C)	-40…176° (-40…80°)
Transducer Material	PVDF	PVDF	PVC/PVDF	PVC/PVDF	PVDF
Protection Class	Type 6P submerged 6 feet (1.8 m) of water, up to 24 hr	Type 6P submerged 6 feet (1.8 m) of water, up to 24 hr	IP68	IP67	IP66/IP68, Type 4X/6P
Mount (US)	1 in. NPT	1 in. NPT	—	—	1-1/2 in. NPT
Mount (EU)	G1	G1	G 1-1/2	G 1-1/2	G 1-1/2
Ratings	CE, RoHS	CE, RoHS	CE (LVD, EMC, RoHS)	ATEX II 2G Ex ia IIB T5 Ga/Gb with isolator	CE (EMC, LVD, RED, RoHS), UKCA
Dimensions H × W × D	3.2 × 2.0 × 2.0 in. (81 × 51 × 51 mm)	4.9 × 3.1 × 3.1 in. (122 × 78 × 78)	5.1 × 2.2 × 2.2 in. (129 × 55 × 55 mm)	4.8 × 2.8 × 28 in. (121 × 71 × 71 mm)	4.28 × 2.99 × 2.99 in. (109 × 76 × 76 mm)



Control. Manage. Optimize.

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